
Basic Call Service

Basic Call Service permits the transmission of the ISDN call. Basic Call Service consists of call progress signaling and voice and data transmission. Basic Call Service is supported for the following switch configurations:

- Meridian 1 to Meridian 1
- Meridian 1 to SL-100
- Meridian 1 to DMS-100
- Meridian 1 to DMS-250
- Meridian 1 to AT&T 4ESS
- Meridian 1 to AT&T 5ESS

See Figure 17 for an example of these configurations.

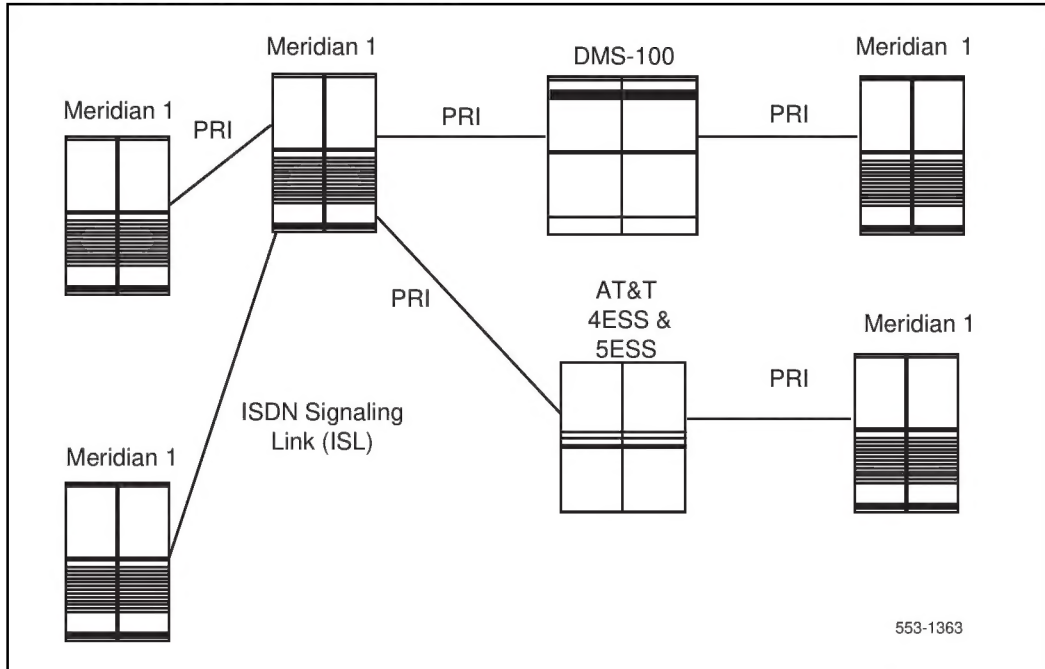
Call progress signaling

PRI supports 56 and 64 kbps out-of-band signaling (on the D-channel) for:

- call setup
- call tear down
- feature activation
- local busy and reorder (overflow supplied locally)

Messages to generate tones are transmitted on the D-channel. Both out-of-band messages and in-band tones are provided for ringback.

Figure 17
ISDN Basic Call Service connections



Voice and data transmission

High-speed voice and data are transmitted on the B-channel and assigned on a per call basis. The following modes of transport are available:

- 56 kbps circuit switched data transmission
- 64 kbps circuit switched voice and data transmission
- 64 kbps packet data transmission

Numbering plans

Three numbering plans are supported:

- Coordinated Dialing Plan (CDP) of 3 to 10 digits
- North American 10-digit numbering plan
- Electronic Switched Network (ESN) 7-digit private numbering plan

Typically, the numbering plan for a customer's private network consists of a 3-digit location code (such as the LOC code) and a 4-digit extension. This allows the same extension to be used for private networks and for Direct Inward Dialing (DID) from the public network.

Note: When using ISDN (without ESN), the caller dials a trunk access code without waiting for a second (or third) dial tone. However, NRAG, NACD, and NMS require dialing plans. They are not supported using Direct Trunk Access.

PSTN Equal Access and Special Number Services

Public Switched Telephone Network (PSTN) Equal Access Service (EAS) allows a customer to select available carriers for long distance telephone service on a call-by-call basis. See Figure 18.

Inter-Exchange Carrier (IEC)

The IEC access code can be defined for a trunk route that is part of the PRI.

When the IEC is not specified in Meridian 1 software, the DMS-100 examines the Called Party Number and selects an appropriate outbound route.

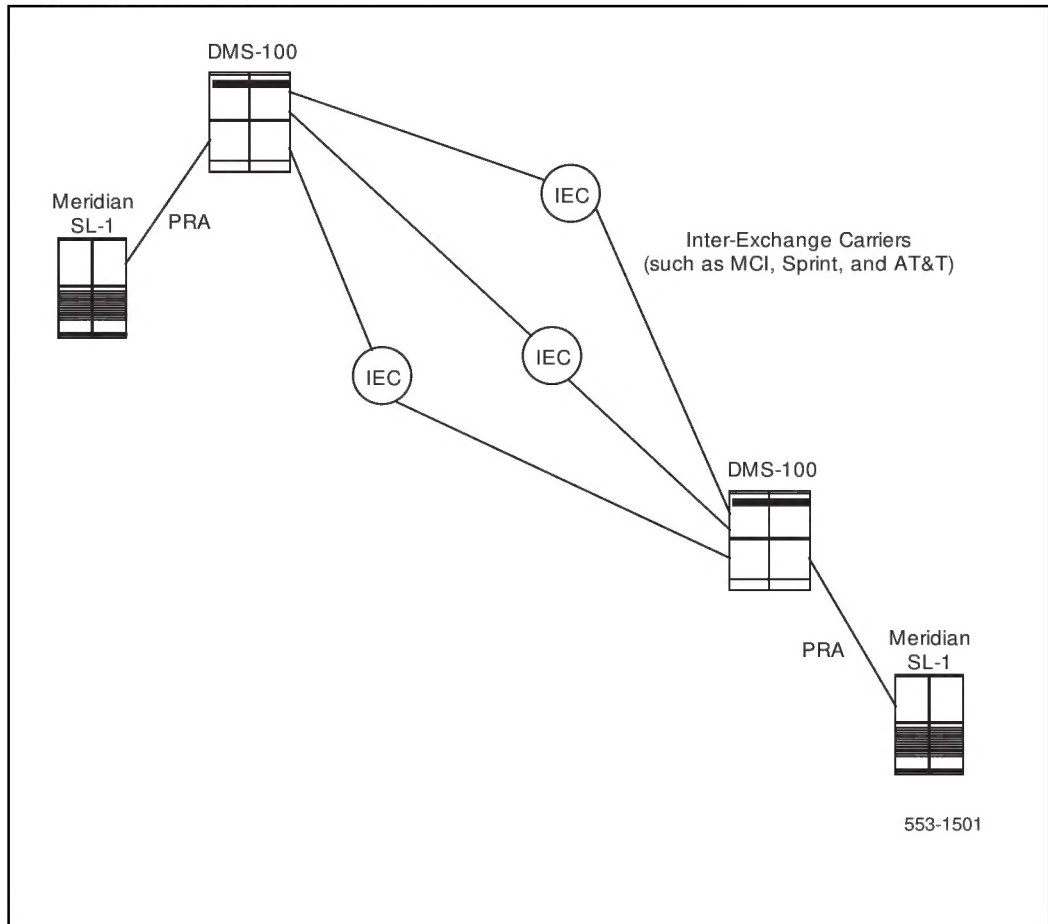
PSTN Special Number Services

These allow access to public network numbers such as:

- 411 for directory assistance
- 911 for emergencies

The user dials a public network access code followed by the special number.

Figure 18
Equal Access Service



64K Clear Data

64K Clear Data allows a customer to send 64 kbps of clear data from the Meridian 1 to the following systems:

- Meridian 1
- SL-100
- DMS-100

64 kbps of clear data can also pass through the AT&T 4ESS and DMS-250 switch as long as the AT&T tandem switch is transparent. See Figure 19 and Table 28 for an example of a configuration that permits the flow of 64 kbps of clear data.

The version IDs of both the originating and the terminating systems must be 2 in order to transmit data at speeds of 64 kbps through the T-Link version 2 protocol.

Selecting the B8ZS line coding method allows the B-channel to transport 64 kbps of clear data. The selection is made in LD 17, the Configuration Record.

On the Meridian 1 side, the 64K Clear Data can only pass through the QMT21 High Speed Data Module MCA or MCU. Therefore, one of these data modules must be connected to each system configured. In addition, 64K Clear Data allows connection to High Speed Data Units (HSDU) through a DMS-100.

64K Clear Data supports ISDN data applications that require a clear 64 Kbps channel, such as communications between two Group IV facsimile machines set for that data rate.

Figure 19 shows the connection options for 64K Clear Data.

Note: 64K Clear Data requires a B8ZS-compatible facility format from the Telco and T1 B8ZS repeaters.

Figure 19
Connection options for 64K Clear Data

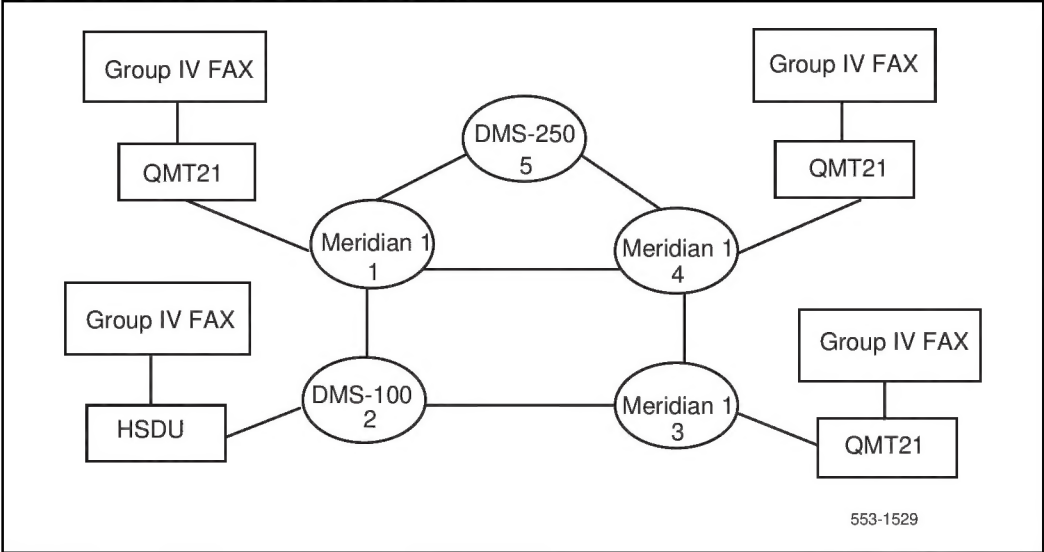


Table 28
Connection options for 64K Clear Data

Path	Originating	Terminating	See Note below
1-2	1	2	1
1-4	1	4	3
1-2-3	1	3	1
1-4-3	1	3	1
1-5-4	1	4	1, 2

Note 1: Requires same release software. X11 release 14 is equivalent to BCS release 29. X11 release 15 is equivalent to BCS release 30. X11 release 16 is equivalent to BCS release 31, and X11 release 17 is equivalent to BCS release 32.

Note 2: This connection only occurs if AT&T tandem switch is transparent.

Note 3: Requires X11 release 13 software or above.

Flexible Numbering Plan

Flexible numbering permits a private network to use up to ten digits for station numbers and up to seven digits for location codes. The total number of digits that need to be dialed can differ from station to station. Flexible Numbering Plan dialing procedures vary, depending on whether calls are made inside or outside the network. In either situation, calls can be handled according to a defined plan.

Local network dialing

Flexible numbering can be used with one of the following plans to create a variety of different network configurations:

- Coordinated Dialing Plan (CDP). Stations on any node have unique 1- to 10-digit numbers. You can transfer 1-digit to 7-digit numbers. Within the CDP group, a caller can reach a station directly without having to input an access code or pause for a dial tone.
- Universal Numbering Plan (UNP). This provides 3- to 7-digit numbers that can be transferred across the network. If a caller dials a vacant number on any node, the call reroutes to a common location, where a list is consulted to determine if there is an alternate location for the called Directory Number. If so, the call is routed to the alternate location. Otherwise, the call is treated as if the dialed number were nonexistent.
- Group Dialing Plan. With group dialing, CDP groups can exist independently within a network. The number used to dial a station varies depending on the location of the calling station. A caller within the CDP group dialing a station on another node must use the steering code followed by the Directory Number. Callers outside the CDP group must precede the Directory Number with the location code. The maximum number of digits permitted for either the location code and Directory Number, the local steering code and Directory Number, or the distant steering code and Directory Number cannot exceed ten digits.

External dialing

Callers who dial another private network or a public exchange station can be subject to one of the following procedures:

- Special number treatment. When FNP is enabled, the outgoing trunk is not seized immediately upon call completion. Instead, trunk seizure occurs when the expected number of digits (maximum of 16) have been dialed, the Fast Connect key has been pressed, or the interdigit timer expires. The Free Special Number Screening (FSNS) capability screens 1- to 11-digit Special Numbers (SPNs) against 3-digit routing codes to allow or restrict calls traveling via those routing codes.
- Universal numbering plan. The maximum number of route-list blocks and digit-manipulation tables allowed is 1000 to support Global Networking and Universal Numbering Plan requirements.

Flexible Numbering Plans do not affect Numbering Plan Area or Office Translation Code dialing.

Fast Connect

With flexible numbering, the system cannot determine instantly when digit dialing is complete. Call connection occurs immediately only if the number dialed has the maximum number of digits. Otherwise, the interdigit timer must expire, triggering automatic call connection. To speed up connections to stations with short numbers, callers can press the Fast Connect key, the octothorpe (#), to force immediate call connection.

Implementation

The Supplemental Digit Restriction and Recognition (SDDR) feature is modified to allow up to seven digits in the digit restriction table. (This is independent of the number of digits entered in response to the NPA, NXX, or LOC service change prompts.)

LD 15, LD 86, LD 90, and LD 87 must be modified as shown in the following tables.

LD 15—Enable or disable Vacant Number Routing

VNR	YES/NO	Enable or disable Vacant Number Routing.
RLI	0–99	Route List Index used for Vacant Number Routing. Prompt appears only if VNR is YES.
CDPL	0–(10)	Flexible length of VNR CDP digits expected. (Set to length of longest number used.) Prompt appears only if VNR is YES.
LOCL	0–(10)	Flexible length of VNR LOC digits expected. (Set to length of longest number used.) Prompt appears only if VNR is YES.
NIT	2–(8)	Value, in seconds, of Network Interdigit Timer.

LD 86—Configure routing

RLI	0–999	Route List Index.
DMI	0–999	Digit Manipulation Index
FSNS	(0)–255	Free Special Number Screening Index
AC1	1–4 digits	Access Code 1
AC2	1–4 digits	Access Code 2

LD 90—Configure translation table data

RLI	0–999	Route List Index for each of TYPE=LOC, TYPE=NPA, TYPE=NXX, and TYPE=SPN.
FLEN	(0)–16 for Special Number (0)–10 for Location Code	Digits expected.

LD 87—Specify routine

DMI	0–999	Digit Manipulation Index
RLI	0–999+	Route List Index. Set separately for distant steering code and trunk steering code (under TYPE=DSC and TYPE=TSC, respectively).
FLEN	(0–16 for Trunk Steering Code (0)–10 for Distant Steering Code	Number of digits expected.
DSP	LSC/HLOC/DN	Specifies that either the Local Steering Code, Home Location Code, or Directory Number is to be used for the Calling Station ID in Group Dialing Plans.
FSNS	1–255	Free Special Number Screening Index (prompted if TYPE=FSNS).
SPN	1–11 digits	Special Number code to be screened.
XXX	DENY/ALLOW	Deny or allow routing codes.
DENY	routing codes or range of routing codes	Codes to be denied; prompted if XXX=DENY.
ALLOW	routing codes or range of routing codes	Codes to be allowed; prompted if XXX=ALLOW.

Equal Access (Carrier Access Code)

A Carrier Access Code (CAC) gives a caller access to any interexchange carrier or Operator Service Provider (OSP). FCC regulations require that Call Aggregators, such as hotels, motels, hospitals, universities, airports, gas stations, and pay telephone owners, provide selective access to the public. Callers dial the CAC to reach their desired carrier or OSP before dialing the telephone number.

Aggregators, although they must allow callers access to any long distance caller, are permitted to block calls *selectively*. Selective equal access lets aggregators choose to block direct-dialed calls that result in charges to the originating telephone. Aggregators cannot block operator-assisted calls.

Northern Telecom provided an up-issue of X11 release 14 in 1992 to conform to FCC Equal Access requirements. Beginning with X11 release 17, all software releases support Equal Access. (X11 releases 15 and 16 do not support Equal Access.) Support for expanded codes, as described in the following paragraph, is available beginning with X11 release 19.

The CAC has included a “10” identifying prefix followed by a three-digit Carrier Identification Code (CIC) for a total of five digits. New FCC regulations, reflected in X11 release 19, require that the CAC expand to seven digits: a “101” identifying prefix followed by a four-digit CIC. The regulations require that both the old five-digit format and the new seven-digit format be supported for an 18 month permissive period during 1995 and 1996. After this period, only the longer format will be supported.

X11 software allows the following operator-assisted North American and international dialing:

- CAC + 0
- CAC + 0 + (NPA) + NXX + XXXX
- CAC + 0 + SAC + NXX + XXXX
- CAC + 01 + CC + NN

X11 software allows or denies the following direct North American and international dialing:

- CAC + 1 + (NPA) + NXX + XXXX
- CAC + 011 + CC + NN

where:

CAC = Carrier Access Code: 10XXX or 101XXXX

NPA = Numbering Plan Area (area code)

NXX = Central office code

(N = any digit except 0 or 1; X = any digit [0–9])

XXXX = any four digits

CC = Country Code

NN = National number

Implementation

Current users who install new software prior to the end of the 1995/1996 FCC transition period must set the Original Carrier Access Code (OCAC) flag in LD 17 to YES.

For complete information on implementation and configuration, refer to “Equal Access Compliance” in *X11 features and services* (553-3001-305).

Interchangeable Numbering Plan Areas

Prior to 1995, all area codes had an N(0/1)X format, where N was any digit from 2 to 9 inclusive and X was any digit, 0 to 9. As of January 1995, area codes have an NXX format, increasing the available codes to 640.

It is important to avoid conflicts among NPAs, central office prefixes, and LOCs. It is recommended that customers implement 1+ dialing to eliminate ambiguity.

Customers who use the Autodial feature, Speed Call, or the Hot Line feature may need to modify the lists and tables associated with these features to accommodate the new prefixes or to reflect changes to numbers resulting from implementation of 1+ dialing.

A detailed summary of this change appears in the North American Numbering Plan chapter of *X11 features and services* (553-3001-305).